CURRICULUM VITAE

BORIS TABAKOFF, Ph.D.
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Date of Birth September 27, 1942

Place of Birth Tien-Tsin, China

Education University of Colorado; Boulder, Colorado

B.A. 1966 Distributive Degree in Chemistry, Biology and Russian
B.Ph. 1966 Pharmacy
Ph.D. 1970 Pharmacology

Positions Held

1968-1970 *NIMH Predoctoral Fellow,* Institute for Behavioral Genetics, Boulder, Colorado

1970-1971 *Research Associate,* Department of Biochemistry, The Chicago Medical School, Chicago, Illinois

1971-1973 *Assistant Professor,* Department of Biochemistry, The Chicago Medical School, Chicago, Illinois

1973-1975 *Associate Professor.* Department of Biochemistry, The Chicago Medical School, Chicago, Illinois

1974-1975 *Visiting Scientist,* Medizinisch-Chemisches Institute, University of Bern, Bern, Switzerland

1975-1978 *Associate Professor,* Department of Physiology and Biophysics, University of Illinois at the Medical Center, Chicago, Illinois

1978-1984 *Professor,* Department of Physiology and Biophysics, University of Illinois at the Medical Center, Chicago, Illinois

1979-1984 *Research Pharmacologist,* Veterans Administration, West Side Medical Center, Chicago, Illinois

1980-1984 *Director.* Alcohol and Drug Abuse Research and Training Program, University of Illinois at the Medical Center, Chicago, Illinois

1983-Present *Founder and CEO,* Lohocla Research Corporation, Chicago, Illinois and Denver, Colorado

1984-1990 *Director,* Division of Intramural Clinical and Biological Research, National Institute on Alcohol Abuse and Alcoholism, NIH Clinical Center, Bethesda, Maryland

1985-1986 *Acting Deputy Director,* National Institute on Alcohol Abuse and Alcoholism, Rockville, Maryland

1990-2013 *Professor and Chair,* Department of Pharmacology, University of Colorado School of Medicine Denver, Colorado

1991-2024 *Faculty Fellow,* Institute for Behavioral Genetics, University of Colorado Boulder, Colorado

2013-2024 *Professor of Pharmacology,* Skaggs School of Pharmacy and Pharmaceutical Sciences, University of Colorado Anschutz Medical Campus, Aurora, Colorado

1991-2024 *Research Professor,* Institute for Behavioral Genetics, University of Colorado Boulder, Colorado

Personal Statement

I was trained as a pharmacologist and a behavioral geneticist at the Institute for Behavioral Genetics at CU Boulder. I held faculty positions in Biochemistry, Physiology as well as Pharmacology. I am currently Research Professor in the University of Colorado Boulder Institute for Behavioral Genetics and have held numerous leadership and management positions directing research and other personnel and being responsible for large budgets. These positions have included Director, Alcohol and Drug Abuse Research and Training Program at the University of Illinois School of Medicine; Director of the Intramural Research Program of NIAAA at NIH; Acting Deputy Director for the Institute, NIAAA, NIH; Chair, Department of Pharmacology, University of Colorado School of Medicine; President, Lohocla Research Corporation, Aurora, Colorado. I have had continued funding since 1971 from the NIH extramural programs when I was not part of the NIH intramural establishment. My career has focused on research on the acute and chronic actions of alcohol and other addictive drugs, including the genetic basis for vulnerability to addiction and alcohol-related organ damage. My recent research has used the genetical genomic/phenotypic approach to understand the genetic basis for complex traits such as metabolic disorder, depression, chronic pain, alcohol sensitivity, preference, and tolerance. Most recently I have focused efforts on medications development in the areas of alcoholism treatment and chronic pain bringing medications for these disorders to first in man trials.

Teaching Experience

Biochemistry	Medical and graduate students
	Areas: Enzyme kinetics, intermediary metabolism, neurochemistry, instrumentation
Pharmacology	Pharmacy, medical, dental, and graduate students
	Areas: Pharmacology of ethanol and sedative hypnotics, antipsychotics, psychoactive drugs including cannabinoids, analgesics, anesthetics, anticonvulsants, and research ethics
Medicinal Chemistry	Pharmacy students. Structure-activity relationships of anesthetics, antipsychotics, anxiolytics
Physiology	Dental, pharmacy, medical and graduate students
	Areas: cellular physiology, physiology of excitable tissues, somatosensory systems, spinal cord physiology and vestibular system, metabolism, and temperature regulation
Graduate Students	Ph.D. awarded – 11; M.S. awarded – 3
Post-doctoral Fellows	– 19
Teaching Awards	Department of Pharmacology, University of Colorado Health Sciences Center, 1998.
	Department of Pharmacology, University of Colorado Anschutz Medical Center, 2006
Recent Teaching	CU Skaggs School of Pharmacy & Pharmaceutical Sciences – PHSC 7568
	CU Skaggs School of Pharmacy & Pharmaceutical Sciences – PHSC 7620 *Principles of Pharmacology*
	P2 Seminar Group Series: Mentor and Assessor
	CU Skaggs School of Pharmacy & Pharmaceutical Sciences – PHSC 7700 *Cannabinoid Pharmacology & Endocannabinoid Physiology*
	CU Skaggs School of Pharmacy & Pharmaceutical Sciences – PHSC 7710

Current Student Advising

Charles Corey, Capstone Thesis: *Controversial Cannabinoid Conversions*

Honors

NIMH Predoctoral Fellowship

Rho Chi Honorary Pharmacy Fraternity

Board of Trustees Research Award, The Chicago Medical School

Research Award, Interstate Postgraduate Medical Association of North America

Hoffman-LaRoche Foundation Fellowship

NIH-Swiss National Science Foundation Fellowship

V.A. Award for Studies on the Etiology of Alcoholism

Schweppe Foundation Fellowship

Grass Foundation Traveling Scientist Program Lecturer

Research Society on Alcoholism Award for Scientific Excellence in Research

Jellinek Memorial Award for Major and Continuing Contributions to Alcohol Research

ADAMHA Administrator's Award for Public Service, US Dept of Health and Human Services

Presidential Rank Meritorious Executive Award, Senior Executive Service, DHHS

Meritorious Award to a Distinguished Alumnus, The Chicago Medical School

2002 Florence Rena Sabin Award, The University of Colorado Health Sciences Center

2007 Mark Keller Award Lecture, NIH, Bethesda, Maryland

2008 Joseph Addison Sewall Award, Anschutz Medical Center, CU Denver

2009 Bowles Award, University of North Carolina School of Medicine

2011 Inducted into University of Colorado Football Living Legends

2015 Research Society on Alcoholism Lifetime Achievement Award

2019 Establishment of the Boris Tabakoff Research Achievement Award by the International Society for Biomedical Research in Alcoholism.

2021 Distinguished Alumni Award - University of Colorado | Skaggs School of Pharmacy and Pharmaceutical Sciences Alumni Association

2022 Designated as an Expertscape Expert on Alcohol Drinking

Scientific Societies

American College of Neuropsychopharmacology (ACNP)

American Society for Neurochemistry

American Society for Pharmacology and Experimental Therapeutics (ASPET)

International Council on Alcoholism and Addictions

International Society for Biomedical Research on Alcoholism (ISBRA)

Research Society on Alcoholism (RSA)

Society for Neuroscience (SFN)

Administrative Posts and National/International Committees and Society Memberships

Chair:	National Foundation for Prevention of Chemical Dependency Disease, 1994-present
Member:	Jellinek Memorial Fund, Board of Directors, 1998 - current
Member	NIAAA NESARC's Expert Committee on Genetics of Alcoholism
President:	International Society for Biomedical Research on Alcoholism (ISBRA), 1986-1990
Member:	International Society for Biomedical Research on Alcoholism (ISBRA); Board of Directors, 1982-1994, 1998-2002
Member:	International Society for Biomedical Research on Alcoholism (ISBRA); Finance Committee, current
President:	American Research Society on Alcoholism (RSA), 1983-1985
Member:	American Research Society on Alcoholism (RSA): Board of Directors, 1987-1993
Member:	WHO Expert Advisory Panel on Drug Dependence & Alcohol Problems, 1987-2014
Member:	ASPET: Committee on Public Affairs, 2000-2010
Member:	ACNP Education and Training Committee, 2002-2008
Scientific Director:	Multicenter WHO/ISBRA Study on State and Trait Markers of Alcoholism, 1998-2006
Chair:	International Society for Biomedical Research on Alcoholism (ISBRA); Liaison Committee, 2002-current
Member:	ACNP Task Force; Barriers to Drug Discovery and Development, 2003
Member:	ASPET Nominating Committee, 2003
Member:	National Advisory Council on Alcohol Abuse and Alcoholism, NIH, 2003-2008
Member:	Jacob P. Waletzky Memorial Award Committee Member, (ACNP), 2006-2013
Member:	International Center for Alcohol Policies (ICAP) Sr. Consultant, 2007-2014
Member:	NIH Advisory Board for development of a national research resource for remapping of the rat genome 2021
Member:	American College of Neuropsychopharmacology (ACNP) 2021
Member:	American Society for Neurochemistry 2021
Member:	American Society for Pharmacology & Experimental Therapeutics (ASPET) 2021
Member:	International Council on Alcoholism and Addictions 2021
Member:	International Society for Biomedical Research on Alcoholism (ISBRA) 2021
Member:	Research Society on Alcoholism (RSA) 2021
Member:	Society for Neuroscience (SFN) 2021
Board Member:	Friends of NIAAA, 2012-present (Lobby Group for Alcoholism Research)
Chair:	National Foundation for Prevention of Chemical Dependency Disease (U.S.)

Member:	Project Committee for American Thoracic Society: Research Priorities for Treatment of Severe Alcohol Withdrawal Syndrome

Editorial Boards

Addiction Biology

Alcohol

Alcohol and Alcoholism

Alcoholism: Clinical and Experimental Research

American Journal on Addictions

British Journal on Alcohol and Alcoholism

International Journal of Molecular Medicine

Journal of Studies on Alcohol

Molecular Interventions

Consultancies, Contributorships, etc.

Consultant:	International Council on Alcohol and Addictions
Contributing Author:	Fifth and Sixth Special Reports to Congress on Alcohol and Health
Reviewer:	Third, Fourth, Sixth, Ninth, and Tenth Special Reports to the United States Congress
Member:	NCA-AMSAODD Joint Committee to Study the Definition & Criteria for the Diagnosis of Alcoholism
Member:	Subcommittee for Review of Neuroscience and Behavior Portfolio, NIAAA/NIH
Member:	NIH Roadmap Committee on Neuroscience
Member:	Scientific Advisory Committee, Lundbeck Pharma
Member:	Scientific Advisory Committee, D&A Pharma

Grant Review Committees

Member:	NIH/ADAMHA Study Section for the Nationall Institute on Alcohol Abuse & Alcoholism 1976-1982
Member:	VA Alcoholism and Drug Dependence Review Board, 1984-1988
Member:	VA Alcoholism Center Review Board, 1990
Reviewer:	National Science Foundation (Ad Hoc)
Reviewer:	Medical Research Council (U.K.) (Ad Hoc)
Reviewer:	The Wellcome Trust (U.K.) (Ad Hoc)
Reviewer:	Medical Research Council (Canada) (Ad Hoc)

Reviewer:	National Institutes of Health (Ad Hoc)
Member:	NIAAA Fellowship Review Committee 2002/2004
Reviewer:	German Federal Ministry of Education and Research (BMBF)
Reviewer:	NIDA Contract Review Committee 2008
Reviewer:	NIDA Loan Repayment Program Committee 2009
Reviewer:	Israel Science Foundation (ISF) 2005
Reviewer:	European Research Advisory Board (ERAB) 2006
Reviewer:	Foundation for Science and Technology of Portugal (Fundacao para a cienca e a tecnologia, FCT) 2006
Reviewer:	Special Emphasis Panel/Scientific Review Group 2009/10 ZRG1 (NIH)
Reviewer:	RFA AA-12-001 DNA Repository for the NIAAA NESARC-1U11 (U24) 2011
Reviewer:	Distinguished Editorial Review Panel 2013
Reviewer:	Research Cooperability Evaluation UKF 2013
Reviewer:	NIH Reviews 2014
Reviewer:	TCORS grants for NIH/FDA 2014
Reviewer:	NIH Discovering New Therapeutic Uses for Existing Molecules (UH2/UH3) 2015
Reviewer:	NIH Identification of Gene Variants (UH2/UH3) 2015
Reviewer:	NIH Informatics Support for NIDA LXF-L(L31)S 2017
Reviewer	NIAAA PAR-15-154 Review: Investigational New Drug (IND)-Enabling Development of Medications to Treat Alcohol Use Disorder and Alcohol-Related Disorders (U44) 2017-2020
Reviewer:	NIH Loan Repayment Program Clinical Research (L30)
Member:	NIH Center for Scientific Review Committee for Advancing Therapeutics (current)

University of Colorado School of Medicine Committees

Member:	Faculty Advisory Committee on the Fitzsimmons Campus Campus Planning Committee Research Complex 1 Oversight Committee Program Adjacency Committee Research Space Advisory Committee Center for Translational Research Committee Administrative Office Space Subcommittee Veterans Administration/UCHSC/UH Research Subcommittee Architectural/Engineering Committee
Member:	Molecular Structure Program Planning Committee
Member:	NMR Facility Director Search Committee
Member:	School of Medicine Executive Committee
Member:	University Physician's, Inc. (UPI) Board of Directors

Member:	Dean's Search Committee (1991)
Member:	Non-Federal ICR Grant Support Committee
Chair:	Committee for Enhanced Leadership of the School of Medicine
Member:	Public Relations Planning Committee
Chair:	Biochemistry/Biophysics/Genetics Chair Search Committee (1994-95)
Member:	Blue Ribbon Committee on Promotion and Tenure
Co-Chair:	School of Medicine Research Retreat Committee
Member:	University Scientists Program (USP) Development Committee
Chair:	Planning & Construction Committee for the NMR Center
Co-Chair:	Allocation of Resources for Research Task Group
Member:	Women's Reproductive Health Research (WRHR) Career Development Center, Advisory Committee
Member:	Program in Biomolecular Structure, Steering Committee
Chair:	Vice Chancellor for Research, UCHSC, Search Committee (2000-2001)
Member:	Policy and Steering Planning Subcommittee (2001)
Member:	School of Medicine Research Strategic Plan Committee (2002-2003)
Member:	Research Park Advisory Committee
Member:	Research on Two Campuses Committee
Member:	Vision 2010 Diversity Committee
Member:	Intellectual Property Formula Committee
Member:	Tech Transfer External Advisory Board
Member:	Basic Science Chairs Representative to Dean's Advisory Group
Member:	Bioscience Park Advisory Committee
Member:	Planning Committee for the Personalized Medicine Initiative (current)
Member:	Vice Chancellor’s Advisory Committee for Reappointment, Tenure and Promotion

Scientific Meetings Organized

Organizer:	Symposium on the Effects of Ethanol on Neuronal Systems, held in Chicago, Illinois; April 1975
Organizer:	Milton M Gross Memorial Symposium on Alcoholism, held in Chicago, Illinois; April 1977
Organizer:	Symposium on Theories of Tolerance and Dependence on Ethanol: Mechanistic Approaches, held in Chexbres, Switzerland; July 1978
Member:	Organizing Committee for the Third International Symposium on Alcohol and Aldehyde Metabolizing Systems, held in Toronto, Canada; July 1979

Chair:	Organizing Committee for the Seminar Series on Alcohol and Drug Abuse, sponsored by the Alcohol and Drug Abuse Interdisciplinary Program of the University of Illinois at the Medical Center; 1980-1984
Chair:	Organizing Committee for the Fifth Biennial International Symposium on Alcoholism, held in Cardiff, Wales; June 1980
Member:	Organizing Committee for the First Congress of the International Society for Biomedical Research on Alcoholism, held in Munich, Germany; June 1982
Member:	Organizing Committee for the Second Congress of the International Society for Biomedical Research on Alcoholism, held in Santa Fe, New Mexico; June 1984
Member:	Organizing Committee for the Annual Meeting of the Research Society on Alcoholism, held in Wild Dunes, South Carolina; May 1985
Member:	Organizing Committee for the Third Congress of the International Society for Biomedical Research on Alcoholism, Helsinki, Finland; June 1986
Member:	Organizing Committee for the Fourth Congress of the International Society for Biomedical Research on Alcoholism, Kyoto, Japan; June 1988
Chair:	Symposium on Pharmacotherapy of Alcohol Withdrawal: Strategies and Pitfalls, for the RSA Meeting held in Marco Island, Florida; June 1991
Chair:	Panel on The Optimal Conditions for Making Science Happen, for the International Conference of Drugs, Alcohol & Tobacco, held in London, England; July 1991
Chair:	WHO/ISBRA Clinical Center Directors Meeting, held in Sydney Australia; November 1991
Member:	Organizing Committee for the WHO/ISBRA Clinical Directors Session on the *State and Trait Markers of Alcohol Abuse and Alcoholism*, San Diego, California; June 1992.
Member:	Organizing Committee for the American Society for Neurochemistry, Denver, Colorado; March 1998.
Member:	Organizing Committee, ISBRA 2000 Meeting, Yokohama, Japan; June 2000.
Member:	CINP 2000 Symposium, Brussels, Belgium; July 2000
Chair:	CINP XXIIIrd 2002 Congress, Montreal, Canada; June 2002
Chair:	Symposium on *The WHO/ISBRA Study on State and Trait Markers of Alcohol Use and Dependence: Recent Findings*, RSA/ISBRA 2002 Meeting, San Francisco, California; July 2002.
Co-Chair:	Symposium on *Alcohol Tolerance in the 21st Century: A Tribute to Harold Kalant*, ISBRA 2004 Meeting, Heidelberg, Germany; September 2004.
Chair:	WHO/ISBRA Symposium on *State and Trait Markers in Alcoholism*, ISBRA 2004, Heidelberg, Germany; September 2004
Member:	CINP 2004 Symposium, *Etiologic Implications of Adenylyl Cyclase in Depression/Anxiety/ Alcohol Abuse*, Paris, France; June 2004
Member:	RSA 2004 Symposium, *Complex Genetics of Interactions of Alcohol and CNS Function and Behavior*, Vancouver, Canada; June 2004
Chair:	RSA 2005 Symposium, *The Paths to excessive Drinking: Neuroadaptation, Chronobiology and Genomics: The Work of the INIA West*, Santa Barbara, California; June 2005

Chair:	ACNP 2005 Symposium, *Arraying the Brain for Alcoholism*, Waikoloa, Hawaii; December 2005
Member:	CINP 2006 Symposium, *Cyclic AMP Mechanisms in Stem Cell Survival and Depression*, Chicago, Illinois, July 2006
Chair and Organizer:	ISBRA 2006 Satellite Symposium, *Alcohol Use Disorders: The Diagnostic Conundrum*, Sydney, Australia, September 2006.
Co-Chair	RSA/ISBRA Symposium, *Emerging Targets at the GPCR Signaling Complex: Implications for Ethanol Reinforcement?* Washington, DC, July 2008
Organizer	RSA/ISBRA Symposium, *Searching for Genes for the Response to Alcohol: From Animal Models to Human Research*, Washington, DC, July 2008
Organizer	ESBRA Symposium, *Forward and reverse genetic approaches in alcohol addiction research*, Helsinki, Finland, June 2009
Organizer	RSA Symposium, *Platelet Proteins as Markers for Hazardous/Harmful Alcohol Consumption*, San Diego, CA, July 2009
Organizer	ISBRA Symposium *Systems Biology for Analysis of Complex Traits Including Alcoholism* Osaka, Japan, September 2018
Co-Chair and Discussant	42nd Annual RSA Scientific Meeting, *Gene Splicing and Fetal Alcohol Spectrum Disorders,* Minneapolis MN., June 2019
Organizer, Chair, and Discussant	ISBRA Meeting Sumposium *Treating Pain, Addiction, and Neuroinflammation from the Periphery,* Melbourne, Victoria, Australia, September 2024

Invited Lectures (from 1995)

Apr 1995	National Institute on Alcohol Abuse and Alcoholism-Workshop on Ethanol and Ligand-Gated Ion Channels, Bethesda, MD. "NMDA Receptors and Alcohol Dependence."
May 1995	XI Congresso Brasileiro de Alcoolismo e Outras Dependencias, Belo Horizonte, Brazil. "Alcohol's actions on the neurotransmitter systems of brain and mechanisms of intoxication, tolerance, dependence and predisposition to alcoholism."
May 1995	Medical University of South Carolina Neuroscience Colloquium Series, Charleston, SC. "Adenylyl cyclase and ethanol: relationships to alcoholism."
Jun 1995	RSA Annual Meeting, Steamboat Springs, CO. Symposium Lecture: "Phosphorylation Cross-Talk and Cellular Actions of Ethanol."
Oct 1995	International Life Sciences Institute-Europe "Extended Alcohol Task Force," Brussels, Belgium. "Possible Role of Moderate Alcohol Consumption on the Physiological Responses of CNS."
Nov 1995	National Institute on Alcohol Abuse and Alcoholism-"Workshop on Tolerance," Indianapolis, IN. "Animal Studies: Potential Mechanisms."
Jun 1996	International Conference on "Neurochemistry and Pharmacology of Drug Addiction and Alcoholism," St Petersburg, Russia. "The role of ligand-gated ion channels as mediators of the effects of ethanol."

Jun 1996	RSA/ISBRA Joint Scientific Meeting, Washington, DC. Symposium Lecture: "WHO/ISBRA multicenter study of state and trait markers of alcoholism: preliminary studies."
Sep 1996	MEDA-sponsored "Substance Abuse and Severe Mental Illness" Meeting, Gothenborg, Sweden. "Neuroadaptation in Ion Channels and Signal Transduction Systems as Determinants of Alcohol Tolerance and Physical Dependence."
Sep 1996	University of Umeå, Sweden. "Adenylyl Cyclase: Its Role in Alcohol Intoxication Tolerance and Predisposition to Alcoholism."
Mar 1997	Finch University of Health Sciences/The Chicago Medical School, Department of Neuroscience Distinguished Seminar Speaker. "Adenylyl Cyclase and Alcoholism: Making a Connection."
Apr 1997	National Institutes of Health, Bethesda, MD. NIAAA Conference on "Genes and the Environment in Complex Diseases: A focus on Alcoholism."
Aug 1997	Medical University of South Carolina, Charleston, SC. "Adenylyl Cyclase and Alcoholism: Making a Connection."
Mar 1998	Bowman Gray School of Medicine, Winston-Salem, NC. "Adenylyl Cyclase and Alcoholism: Making the Connection."
Jun 1998	International Society for Biomedical Research on Alcoholism, Copenhagen, Denmark. "Multicenter Study of State/Trait Markers of Alcoholism."
Jun 1998	Research Society on Alcoholism, Charleston, SC. Tribute for Marcus Rothschild, "Adenylyl Cyclase and Alcoholism: Making the Connection."
Jul 1998	XIIIth International Congress of Pharmacology, München, Germany. "Adenylyl Cyclase and Alcoholism: Making the Connection."
Jun 1999	Research Society on Alcoholism, Santa Barbara, CA. "Sensitivity and Tolerance: From the Simplistic to the Sublime."
Jun 1999	European Society for Biomedical Research on Alcoholism, Barcelona, Spain. "Alcohol Action on Central Nervous System: Alcohol Dependence: Mechanisms and Treatments
Nov 1999	American Society of Addiction Medicine, Washington DC. "Dependence and Its Treatment: A Matter of Knowing the Right Channels."
Nov 1999	University of Nebraska Medical School, Omaha, NE. "Adenylyl Cyclase, Alcohol's Actions, and Alcoholism."
Mar 2000	NIAAA: Governors' Spouses Conference; Leadership to Keep Children Alcohol Free, National Conference, Washington, DC. "Alcohol's Actions on the Brain."
Apr 2000	NIAAA, Kindling Workshop, Washington, D.C. "Glutamatergic Insult: Single and Multiple Withdrawals."
May 2000	APA Annual Meeting, Chicago, IL. "Alcohol Action on Central Nervous System: Alcohol Dependence: Mechanisms and Treatments."
Jun 2000	International Society for Biomedical Research on Alcoholism Annual Meeting, Yokohama, Japan. "Overview of the WHO/ISBRA Study on State and Trait Markers in Alcoholism."
Jun 2000	International Society for Biomedical Research on Alcoholism Annual Meeting, Yokohama, Japan. "Transgenic and Gene 'Knockout' Models in Alcohol Research."

Jun 2000	International Society for Biomedical Research on Alcoholism Annual Meeting, Yokohama, Japan. "Cyclic AMP Signaling in Ethanol Sensitivity and Tolerance."
Jul 2000	International Symposium on Recent Advances in Biomedical Research on Alcoholism, Taipei, Taiwan. "Phosphorylation Cascades Control Ethanol's Actions on Cell cAMP Signaling."
Jul 2000	XXIIth International Congress of Pharmacology, Brussels, Belgium. "Actions of Ethanol on Adenylyl Cyclase Isoforms and Protein Kinase C."
Jul 2001	Research Society on Alcoholism, Montreal, Canada. "Using Gene Expression Array Analysis to Characterize the CNS of Genetically Altered Mice." Symposium: Expression Profiling and Ethanol Action: Molecular Patterns of Behavior.
Jul 2001	Research Society on Alcoholism, Montreal, Canada. "The Private Sector and the Scientific Community: A Hands-On or Hands-Off Relationship?"
Sep 2001	Department of Pathology, UCHSC, Grand Rounds. "The Post-Genomic Analysis of Complications of Alcoholism."
Nov 2001	University of North Carolina, Chapel Hills, North Carolina. "Arraying Alcohol Tolerance."
Dec 2001	American College of Neuropsychopharmacology, Waikoloa, Hawaii. Panel: "Type 7 Adenylyl Cyclase as a Control Element in Drug Sensitivity and Tolerance;" Presentation: ""Pathways to Addiction."
Jan 2002	Winter Conference on Brain Research, Snowmass, Colorado. "The Study of AC7 Transgenic and 'Wild-Type' Mice."
Feb 2002	Grand Rounds: University of Illinois, College of Medicine. "Alcohol Sensitivity and Tolerance: It's what We Express That Matters."
May 2002	The Benedict J. Latteri Memorial Scientific Symposium on Ion Channels and Synaptic Transmission, Bethesda, Maryland. Presentation: "Glutamate Receptors: The A, N, and K of Alcoholism."
Jun 2002	RSA Symposium, San Francisco, California. *Patterns of Gene Expression in Brain of Transgenic and Selected Lines of Mice that Differ in Ethanol Tolerance.*
Jul 2002	RSA/ISBRA Meeting, San Francisco, California. Presentation: *WHO/ISBRA Study on State and Trait Markers: Recent Findings.*
Mar 2004	Chancellor's Society Luncheon, UCHSC, School of Medicine. *The Brain Signals for Depression and Alcoholism.*
Mar 2004	Neuroscience Seminar Series, University of Cincinnati, College of Medicine. *Signaling Depression.*
Mar 2004	Alcoholism Seminar, NURA, Inc., Seattle, Washington. *Target Discovery and Medications Development for Addictions and Affective Disorders.*
Jun 2004	NIDA International Forum: Progress Through Collaboration, San Juan, Puerto Rico. *An International Study on Alcoholism Drug Abuse.*
Jun 2004	CINP Congress. Paris, France. Breaking Scientific News Session: *Etiologic implications of adenylyl cyclase in depression/anxiety/alcohol abuse.*

Jun 2004 RSA Symposium. Vancouver, Canada. *Complex genetics of interactions of alcohol and CNS function and behavior.*

Sep 2004 ISBRA Symposium. Heidelberg, Germany. *The WHO/ISBRA study on state and trail markers of alcohol use and dependence: back to the future* and *Alcohol tolerance in the 21st century: A tribute to Harold Kalant.*

Sep 2004 Scientific Seminar. Basel, Switzerland. *The use of genetically modified mice and gene expression arrays to uncover the etiology of anxiety and depression.*

Feb 2005 Regis College Seminar. Denver, Colorado. *Microarraying the brain: Insights into mental illness.*

Nov 2005 National Research Center on Addictions International Symposium, Moscow, Russia. "Novel Medications for Alcoholism: From Basic Science to Therapeutics."

Mar 2006 Japanese Society for Biomedical Research on Alcoholism (JASBRA), Sapporo, Japan. Plenary Lecture *Why do mice (and some men and women) drink? A genetic/genomic analysis.*

May 2006 ICAP Scientific Reviews Symposium. Boston, MA. Risks and Benefits of Moderate Alcohol Consumption. *Predisposition to drink alcohol & develop tolerance: looking inside the brain through the window of gene expression.*

Jul 2006 CINP 2006 Symposium. Chicago, IL. *Cyclic AMP Mechanisms in Stem Cell Survival and Depression*

Dec 2006 ACNP Symposium. Hollywood, FL. *Integrative Genomics of Alcoholism.*

Jan 2007 INSERM/NIAAA Symposium. Paris, France. *Drinking Alcohol: Genomic Discovery of Genetic Predisposition in Mice, Rats and Man.*

Mar 2007 Department of Pathology, Grand Rounds, UCDHSC, Aurora, Colorado. *Genetics of Alcoholism: Gene Expression, Informatics and Markers.*

May 2007 NIDA Addiction, Microarrays and Gene Discovery Workshop, Washington, DC. *MAGIC-B: Gene Arrays, bQTLs, eQTLs, and Candidate Genes.*

Sep 2007 ESBRA Congress. Berlin, Germany. Keynote Speaker *Why Mice, Rats and Some Humans Drink.*

Oct 2007 Mark Keller Honorary Lecture Series (NIAAA). Bethesda, MD. *Why Mice, Rats and Some Humans Drink Alcohol: A Neurobiologic/Genomics Perspective.*

Jul 2008 RSA/ISBRA Symposium, Washington, DC. *Sensitivity and Tolerance: A Genomic Analysis for Candidate Genes in Mice.*

Jun 2009 Boston University Bioinformatics Student-Organized Symposium, Boston, MA. *Genetical/genomics and phenomics approaches for understanding complex behaviors.*

Jun 2009 ESBRA Symposium, Helsinki, Finland. *Forward and reverse genetic approaches in alcohol addiction research.*

Jul 2009 RSA Symposium. San Diego, CA. *Platelet Proteins as Markers for Hazardous/Harmful Alcohol Consumption.*

Nov 2009 Joint Symposium of the Japanese Society for Psychiatric Research on Alcoholism (JSPRA) and Asia-Pacific Society for Alcohol and Addiction Research (APSAAR), Seoul, Korea. *Alcoholism and Depression: Possible Common Pathophysiology*.

Jan 2010 Seminar at the Laboratory of Clinical and Translational Studies: *Why do we want to know about your drinking and how can we find out?*

Apr 2010	NIAAA Extramural Research Seminar: *Alcohol Research is a Pain: How a medications development program for alcoholism developed a drug for chronic pain.*
Jun 2010	RSA Satellite Symposium: *A Systems Biology Approach to Understanding the Effects of Alcohol on the Brain*.
Jun 2010	NIAAA Workshop at the annual meeting of RSA: *Transcriptomics and Proteomics in Alcoholism.*
Sep 2010	ISBRA symposium, *Symposium honoring Helena Stibler: the CDT Story.*
Sep 2010	SMO.IR Clinical Development in Alcohol Dependence, *From Alcohol Dependence Mechanisms to Meeting Therapeutic Needs*.
Nov 2010	CSU Integrated Systems Biology seminar *A gourmet recipe: Mixing genetics, genomics and phenomics for candidate gene discovery.*
Jun 2011	RSA Scientific Meeting, Atlanta, GA. *The biometric measurement of alcohol consumption*.
Sep 2011	European Society for Biomedical Research on Alcoholism, Vienna Austria. *Neurobiology of GHB in relation to alcohol dependence*, Symposium; *New genetic findings according to Lesch Typology* lecture; *Does addiction research need a paradigm shift?* lecture.
May 2012	108th Annual Meeting of The Japanese Society of Psychiatry and Neurology, Sapporo Japan
Sep 2012	16th Congress of International Society for Biomedical Research on Alcoholism (ISBRA), Sapporo Japan. *Chair of ISBRA Plenary Lecture.*
Nov 2012	4th Meeting of the International Advisory Board for Clinical Development in Alcohol Dependence, Rome Italy
May 2013	9th International Workshop on Computational Neuropsychiatry, Munich Germany
Sep 2013	5th Meeting of the International Advisory Board for the Development of Sodium Oxybate in the Treatment of Alcohol Dependence, Warsaw, Poland
Jun 2014	RSA/ISBRA Scientific Meeting, Bellevue, Washington.
Mar 2015	NIEHS, Population-Based Rodent Resources for Environmental Health Sciences, *Recombinant Inbred Rats: Genetics, Transcriptomes, and Use for Identifying Phenotypic Determinants*, National Institute of Environmental Health Sciences, Raleigh Durham, North Carolina
May 2015	Third Alcohol Conference, *The Transcriptional Connectome of the Liver: Insight into Pathologic Consequences*, Crete Greece
Jun 2015	Research Society on Alcoholism Scientific Meeting, Lifetime Achievement Award Presentation, San Antonio, Texas
Dec 2015	Rat Genomics and Models, *RNA-Seq and Ethanol Metabolism: A New Twist to an Old Problem*, Cold Springs Harbor Laboratories, New York, New York
Jun 2016	Research Society on Alcoholism Scientific Meeting, Genetic Sources of Variation in the Rate of Alcohol Metabolism and Acetate Production, New Orleans, Louisiana
Sep 2016	ISBRA ESBRA World Congress, The Road to Recovery: Perspective from a Small Biotech Firm, Berlin Germany
Jun 2017	CTC Rat Genome Conference, *The Rat Based Pipeline for Systems Genetic Analysis,* Memphis, Tennessee

Jun 2017	Research Society on Alcoholism Scientific Meeting, *The PhenoGen Resource: The Rat Based Pipeline for Systems Genetic Analysis,* Denver, Colorado
Dec 2017	Department of Medicine Research & Innovation Conference, *The Road to Personalized Medicine: From Rat to Human and Back.* Aurora, Colorado
Jan 2018	NIDA Genetics Consortium Meeting, *The Construction of a Tool that Predicts the Pathways from the Genome to Phenotype* Rockville, MD
Jun 2018	RSA 41st Scientific Meeting, *Predicting the Pathways from the Genome to Phenotype Using a Systems Genetic Approach.* San Diego, California
Sep 2018	ISBRA annual meeting, *Systems Biology for Analysis of Complex Traits Including Alcoholism* (the NFPCDD Symposium), Kyoto Japan
Jan 2019	NIDA and NIAAA Genetics and Epigenetics Research Meeting, Rockville Maryland
Jan 2019	International Rat Omics Consortium (IROC) Meeting, *Update on HRDP transcriptome project* Rockville Maryland
Jan 2020	NIDA Genetics & Epigenetics Consortium, Washington, D.C.
Jan 2020	NIH HEAL investigators Meeting, Bethesda, MD
Feb 2020	Rocky Mountain RNA Symposium, Aurora, CO
Jun 2021	RSA ISBRA Roundtable (Virtual)
Jul 2021	FENS, *A Holistic Approach to Treatment of AUD* (Virtual)
Nov 2021	European Society of Medicine (ESMED), *circRNA, Hypertension and Cardiac Hypertrophy,* Vienna, Austria
Nov 2021	Regis University Department of Pharmaceutical Sciences Seminar Series, *Drug Development: From Concept to Clinic,* Denver, CO
Apr 2022	3rd Annual NIH HEAL Initiative Investigator Meeting (Virtual by Invitation), Share research breakthroughs and cutting-edge science.
Jun 2022	Presentation at College Problems Drug Dependence, *A Novel Chemical Entity to Ameliorate Chronic Pain & Reduce Opiate Use.*
Jun 2022	45th Annual RSA Scientific Meeting, *Alcohol Effects on Cyclic AMP Signaling in the Central Nervous System and Blood Cells: Mechanisms and Therapeutic Implications,* Orlando, FL
Sep 2022	2nd World Congress on Alcohol & Alcoholism, Joint meeting of ISBRA & ESBRA, Cracow Poland, (Invited Speaker)
Oct 2022	Present Webinar: Cannabinoids as Modulators of Calcium Signaling
Dec 2022	Colorado Bioscience Association Leadership Roundtable

Grant Support During Past 30 Years (Only Direct Costs)

(Prior to 1984, Dr. Tabakoff held numerous grants from NIH, NSF, the State of Illinois, and private foundations)

Past University Administered Grants – B. Tabakoff, P.I.

TDC

1980-1985	NIAAA	Alcoholism Training for the Basic Scientist (T32 AA07374)	$ 367,133
1982-1986	NIAAA	Ethanol Effects on Brain Opiate-Dopamine Interactions (K05 AA00063) Career Development Award	$ 424,878
1984-1990	NIAAA	Intramural Research Support	$6,000,000*
1991-2002	NIAAA	Alcohol and Neuronal Signal Transduction (1R01 AA09014)	$2,964,368
1993-1997	NIAAA	Genetic Approaches to Neuropharmacology of Ethanol, Comp 6 (P50 AA03527)	$ 678,678
1997-2002	NIAAA	Ethanol and NMDA Receptor Function (5R01 AA09005)	$1,456,625
1997-2002	NIAAA	Adenylyl Cyclase Transgenic Mice and Alcoholism, mentor (1K01 AA00240)	$ 814,463
1997-2002	NIAAA	Genetic Approaches to Neuropharmacology of Ethanol, Comp 5 (P50 AA03527)	$1,170,692
2001-2006	NIAAA	Gene Array Technology Center for Alcohol Research (R01 AA13162)	$7,649,330
2001-2006	NIAAA	Integrated Neuroinformatics Resource for Alcoholism (U01 AA13524)	$3,654,122
2001-2006	NIAAA	Pathways to Alcohol Tolerance (U01 AA13489)	$2,017,310
1991-2006	NIGMS	Predoctoral Training Program in Pharmacology (T32 GM07635)	$4,551,181
2006-2012	NIAAA	Colorado Gene Array Core (U01 AA016663)	$1,663,770
2009-2011	NIAAA	Gene Array Technology Center for Alcohol Research (R-GAP) (R24 AA013162-08S1) ARRA Supplement	$ 596,166
2008-2012	NIAAA	Genomic Regulatory Sequence Analysis for Alcohol-Related Phenotypes K01 awarded to Katerina Kechris Sponsored by Boris T.	$ 672,283
2012-2017	NIAAA	RGAP: The Heritable Transcriptome and Alcoholism	$4,201,456
1983-2013	BANBURY FUND	State & Trait Markers for Current Alcohol Consumption	$4,200,000
2013-2018	NIAAA	Genome-wide identification of miRNAs associated with alcoholism Endophenotypes (IR01 AA021131)	$1,503,500

* This figure represents only the portion devoted to Dr. Tabakoff's personal research endeavors and not the approximately $20 million per year appropriated to the program he managed at NIH.

NIH and Industry Contracts

1996-1997	NIAAA	Joint Project on State and Trait Markers of Heavy Alcohol Consumption and Alcoholism (263-MD-632941)	$ 99,980

1997	NIAAA	Joint Project on State and Trait Markers of Heavy Alcohol Consumption and Alcoholism (N01AA72009)	$ 98,050
1999	NIAAA	Joint Project on State and Trait Markers of Heavy Alcohol Consumption C and Alcoholism (N01AA92002)	$ 49,997
1996-1998	Pharmacia Diagnostics	Study of CDTect™ EIA, an Enzyme Immunoassay for Quantitative Measurement of Carbohydrate Deficient Transferrin in Human Serum as a Tool for Monitoring Abstinence & Relapse in Patients Treated for Alcohol Abuse & Dependence (95TDXX003)	$ 153,000
2000	WHO	WHO/ISBRA Study on Biological Markers of Alcohol Use and Dependence (HQ/00/184741 and HQ/00/184754)	$ 10,009
2004-2005	NIAAA	Development of Correlation Alcohol-Relevant Database for Mouse Transcriptome & Proteome (HHSN28120041001DC)	$ 156,217
2004-2005	NIAAA	NESARC plus genes pilot project	$ 80,000

Current University of Colorado Administered Grants

RENEWAL PENDING

5R24 AA013162-20 (Tabakoff, Contact PI)

NIAAA	Full Grant Period 08/01/2001-07/31/2023	Direct Costs for Total Period $2,757,524	Total Costs for Total Period $4,015,568
	Current Project Period 08/05/2017-07/31/2023	Direct Costs for Current Year $426,447	Current Budget Year 08/01/2021-07/31/2023
	Time Commitment 4.0 Calendar		

The Heritable Transcriptome and Alcoholism: This R24 resource grant builds upon our existing infrastructure to develop the 96 strain Hybrid Rat Diversity Panel (HRDP) to be used to broadly study disease mechanisms, the impact of the environment, and for therapeutic drug development. This panel of rats will be used to map complex traits through powerful analysis of genomic and phenotypic data. In addition, the HRDP provides a genetically stable population that can be reused and renewed.

Current NIH Grants (through Lohocla Research Corporation)

ACTIVE

4R44 AA024905-07

NIAAA	Full Grant Period 09/25/2015-06/30/2026	Direct Costs for Total Period $7,973,345	Total Costs for Total Period $11,162,460
	Current Project Period 09/01/2022-08/31/2025	Direct Costs for Current Year $1,396,123	Current Budget Year 07/01/2024-06/30/2025
	Time Commitment 4.0 Calendar		

We are developing a totally new medication to treat AUD. This medication has, in studies with alcohol-dependent animals, been shown to reduce alcohol consumption and prevent relapse. The goal of this grant is to complete and submit an Investigational New Drug (IND) application to the Food and Drug Administration (FDA) and, upon approval, to perform the first-in-human clinical trials of safety and tolerability of Nezavist in humans.

5UH3 DA047680-05

NIDA	Full Grant Period 03/15/2019-06/30/2025	Direct Costs for Total Period $10,697,467	Total Costs for Total Period $14,976,154
	Current Project Period 07/01/2022-06/30/2025	Direct Costs for Current Year $1,375,462	Current Budget Year 07/01/2023-06/30/2025
	Time Commitment 4.0 Calendar		

This project entails the completion of the IND application to the FDA for Kindolor, a medication to treat chronic pain syndromes, and to complete Phase 1a & b, first in human trials. The final phase of this project will be the plan for the Phase 2 trials for the indication of use to treat painful diabetic neuropathy.

Books

Edited Volumes

1. Specifications and Criteria for Biochemical Compounds. Biogenic Amines and Related Compounds. Editors: Verbiscar AJ, Deitrich RA, Pratt EL and **Tabakoff B**, National Academy of Sciences, Washington, DC (1977).
2. Proceedings of the Milton M. Gross Memorial Symposium on Alcoholism. Editors: **Tabakoff B**, Randall CL, Hoffman PL and Collins MA. *Drug and Alcohol Dependence*, Volume 2, Numbers 5/6, Elsevier Sequoia, SA, Switzerland (1977).
3. Proceedings of the Symposium on Theories of Tolerance and Dependence on Ethanol. Editors: **Tabakoff B**, Gelpke C and Gragg F. *Drug and Alcohol Dependence*, Volume 4, Numbers 1/2, 3/4, Elsevier Sequoia, SA, Switzerland (1979).
4. Proceedings of the Fifth Biennial International Symposium on Alcoholism. Editors: **Tabakoff B**, Hoffman PL and Anderson, RA Jr. *Pharmacol. Biochem. Behav.*, Volume 13, Supplement 1, Ankho International, New York, (1981).
5. Medical and Social Aspects of Alcohol Abuse. Editors: **Tabakoff B**, Randall C and Sutker P. Plenum Publishing Corporation, New York (1983).
6. Alcohol Research From Bench to Bedside. Editors: Gordis E, **Tabakoff B** and Linnoila M. Haworth Press, New York (1989).
7. Genetic Aspects of Alcoholism. Editors: Kiianmaa K, **Tabakoff B** and Saito T. The Finnish Foundation for Alcohol Studies, Helsinki (l989).
8. The Biological Aspects of Alcoholism: Implications for Prevention, Treatment and Policy. Editors: **Tabakoff B** and Hoffman PL. The World Health Organization Expert Series on Neuroscience, Hogrefe & Huber Publishers, Seattle (1995).

Book Reviews, Editorials, Letters and Scientific Commentaries

1. **Tabakoff B** (1978) Alcohol and Opiates: Neurochemical and Behavioral Mechanisms. Blum K, ed, Academic Press, New York (1977). In: *Alcohol Clin Exp Res* 2:229-230.

2. **Tabakoff B** and Sutker PB (1979) Currents in Alcoholism, Volume III and IV. Seixas FA, ed, Grune and Stratton, New York (1978). In: *Drug and Alcohol Dependence* 5:81-85.

3. **Tabakoff B** (1980/1981) Dependence of Alcohol and Alcoholism. Kricka LJ and Clark TMS, eds, Ellis Horwood Ltd, England. In: *Alcohol Health and Research World* 5:69-70.

4. **Tabakoff B** (1982) Biochemistry and Pharmacology of Ethanol, Volumes 1 and 2. Majchrowicz E and Noble EP, eds, Plenum Press, New York (1980). In: *Psychopharmacology Bulletin* 18:2-3.

5. **Tabakoff B** (April 5, 1985) Science Letters, Alcoholism Research, (January 11, 1985). In: *Science* 228:6.

6. **Tabakoff B** (1986) Mechanisms of Tolerance and Dependence. Sharp CW, ed, *NIDA Research Monograph* No 54, US Government Printing Office, Washington, DC (1985). In: *Contemporary Psychology* 31:357.

7. **Tabakoff B** (1987) How Alcohol Intoxicates. Hunt WA, ed, Alcohol and Biological Membranes, Guilford Press, New York (1985). In: *Contemporary Psychology* 32:77.

8. **Tabakoff B** (1988) Russian Drinking: Use and Abuse of Alcohol in Pre-Revolutionary Russia. Segal BM, ed, *Monographs of the Rutgers Center of Alcohol Studies* No l5 New Jersey, (l987). In: *Contemporary Psychology* 33:1093.

9. **Tabakoff B** (December 17, 1987) Washington Post Letters to the Editor. Alcoholism: A Treatable Disorder.

10. **Tabakoff B** (1989) Letter to the Editor, Treatment of Alcoholism. In: *New England Journal of Medicine* 321:400.

11. Gordis E, **Tabakoff B** (1990) Goldman D and Berg K, Editorial, Finding the Gene(s) for Alcoholism. *JAMA* 263:2094-2095.

12. **Tabakoff B** (1990) Commentary, One man's craving is another man's dependence, *British Journal of Addiction* 85:1253-1254.

13. **Tabakoff B** (1990) Prologue to *Treatment Choices for Alcoholism and Substance Abuse*, Milkman HB and Sederer LI, eds, Lexington Books, pp 1-6.

14. **Tabakoff B** (1991) Psychoactive Drugs: Tolerance and Sensitization. Goudie JA, Emmett-Oglesby MW, eds, *Psychoactive Drugs: Tolerance and Sensitization*, Humana Press, New Jersey (1989). In: *Contemporary Psychology* 36:424-425.

15. **Tabakoff B** and Hoffman PL (1993) The neurochemistry of alcohol. In: *Current Opinion in Psychiatry* 6:388-394.

16. Hoffman PL, **Tabakoff B** (1994) The role of the NMDA receptor in ethanol withdrawal. *Medicina delle Tossicodipendenze* (*Italian Journal of the Addictions*) 2:20-25.

17. **Tabakoff B** (1994) Alcohol and AIDS - is the relationship all in our heads? *Alcohol Clin Exp Res* 18:415-516.

18. **Tabakoff B** (1994) The eighth key to memory's door. *Alcohol Clin Exp Res* 18:1527-1529.

19. **Tabakoff B** (1995) Ethanol's action on the $GABA_A$ receptor: is there a requirement for parsimony? *Alcohol Clin Exp Res* 19:1597-1598.

20. Hoffman PL, **Tabakoff B** (1996) To be or not to be: how ethanol can affect neuronal death during development. *Alcohol Clin Exp Res* 20:193-195.

21. **Tabakoff B** (1996) From a to b to serendipity: the story of a monoamine oxidase knockout. *Alcohol Clin Exp Res* 20:195-196.

22. **Tabakoff B** (2001) Can one tell a book by its cover? *Addiction* 96:1667-1668.

23. Martinic M (2001) The research community and the private sector: A hands-on or hands-off relationship? (Prepared on behalf of symposium participants: Diamond I, Grant M, Greenfield T, Hacker G, Lewis D, Nadeau L, Riley E and **Tabakoff B**) *Alcohol Clin Exp Res* 25:1801-1804.

24. **Tabakoff B,** Hoffman PL (2012) Commentary, Transducing Emotionality: The Role of Adenylyl Cyclases, *Biol Psychiatry* 71:572-573.
25. **Tabakoff B** (2016) Commentary, An opinion regarding the INEBRIA position statement on the alcohol industry and the thoughts of others on this issue, *J Stud Alcohol Drugs* 77: 8-9.
26. **Tabakoff B** (2017) Commentary, Friday Feedback: Getting into the Weeds of Marijuana Policy, *Medpage Today* https://www.medpagetoday.com/publichealthpolicy/healthpolicy/66241.
27. Badawy AA, **Tabakoff B** (2017) Myrddin Evans: A Gentleman and a Founder of the Medical Council on Alcohol (MCA) and its Journal. *Alcohol Alcoholism*, Mar. 1, 1-2.

Articles for Laypersons

1. **Tabakoff B** and Petersen RC (1988) Brain Damage and Alcoholism. The Counselor, pp 13-16 September/October issue.
2. **Tabakoff B** and Petersen RC (1988) Reports from research centres-13: Intramural research program of the National Institute on Alcohol Abuse and Alcoholism. Br J Addict 83:495-504.
3. **Tabakoff B** and Petersen RC (1989) Alcoholism and Heredity. The Counselor, Part I appeared in July/August issue, pp 14-15; Part II appeared in September/October issue, pp 10-12.
4. **Tabakoff B** and Petersen RC (1990) Acute Alcohol Intoxication. The Counselor, pp 27-29 September/October issue.
5. **Tabakoff B**, Hoffman PL and Petersen RC (1990) Advances in Neurochemistry: A Leading Edge of Alcohol Research. Alcohol Health & Research World 14:138-143.
6. Anthenelli RM and **Tabakoff B** (1995) The search for genetic markers. Alcohol Health and Research World 19:176-181.

Patents

U.S. Patent No. 4,528,295 Composition and Method for Reducing Blood Acetaldehyde Levels

U.S. Patent No. 4,770,996 Identification of Individuals Predisposed Toward Alcohol Abuse

U.S. Patent No. 6,962,930 Compounds, Composition and Method Suitable for Amelioration of Withdrawal Syndromes and Withdrawal-Induced Brain Damage

U.S. Patent No. 7,659,082 Method for identifying analgesic agents

U.S. Patent No. 7,923,458 Method for Treating Chronic Pain

U.S. Patent No. 8,410,054 Methods for treating pain by inhibition of the SCN9A channel

U.S. Patent No. 8,168,402 Diagnostic Tests of Substance Use Disorders

U.S. Patent No. 10,112,905 Multifunctional aminoquinoline therapeutic agents

U.S. Patent No. 10,391,088 Analgesic compositions

U.S. Patent No. 10,435,371 Multifunctional aminoquinoline therapeutic agent

U.S. Patent No. 10,875,831 Process for preparing 1,4-dihydro-4-oxoquinoline-2-carboxylates and 4-aminoquinoline compounds therefrom

U.S. Patent No. 11,130,737 Multifunctional aminoquinoline therapeutic agents

Patent Applications

European Patent Application No. 19858445.0, regional phase of PCT/US2019/049457

U.S. Patent Application 17/669,767 (continuation-in-part of PCT/US20/046038, a continuation of U.S. Serial No. 16/537,936

European Patent Application (Regional phase of PCT/US20/046038, a continuation of U.S. Serial No. 16/537,936)

Japanese Patent Application (National phase of PCT/US20/046038, a continuation of U.S. Serial No. 16/537,936)

Canadian Patent Application (National phase of PCT/US20/046038, a continuation of U.S. Serial No. 16/537,936)

Contributions to Science

A full list of my published work can be found at: http://www.ncbi.nlm.nih.gov/pubmed/?term=Tabakoff+b
I have had a long and satisfying scientific career encompassing bench science, science administration and academic administration. I have published over 385 peer-reviewed papers which have been cited close to 20,000 times. My h-index is currently 74 (Harzing's Publish or Perish statistics).

I. My thesis work trained me as an enzymologist, pharmacologist, and geneticist. My thesis was based on my discovery of the first two members of the aldehyde reductase enzyme family now called aldo-keto reductases (Tabakoff and Erwin, Purification and characterization of a reduced nicotinamide adenine dinucleotide phosphate-linked aldehyde reductase from brain. *J Biol Chem* 245:3263-3268 (1970); Erwin and Tabakoff, Purification and characterization of an NADH-linked aldehyde reductase from bovine brain. *J Neurochem* 19:2269-2278 (1972)). In characterizing these enzymes in various organs I discovered that these were the enzymes that converted the biogenic amines to their reduced metabolites, e.g., DOPAC, MOPEG and 5-HTOL (Tabakoff et al., Enzymatic reduction of "biogenic" aldehydes in brain, *Mol Pharmacol* 9:428-437 (1973)), thus we completed the mapping of biogenic amine catabolism for use in neuroscience. More recently 5-HTOL has become a biological marker of recent alcohol consumption. I made my second discovery of a novel neurotransmitter metabolizing enzyme while on sabbatical in Bern, Switzerland. I referred to this enzyme as succinic semialdehyde (SSA) reductase, since it converted the intermediate of GABA metabolism, SSA, to g-hydroxybutyrate (GHB) in brain (Anderson et al., Formation of gamma-hydroxybutyrate in brain, *J Neurochem* 28:633-639 (1977)). GHB may well be an endogenous (as well as exogenous) ligand for the GABA-B receptor and certain GABA-A receptors. All of this work included an interest in the pharmacology of ethanol and other sedative hypnotics through demonstration of these drugs' actions on the function of these enzymes.

II. In regard to studies on the physiologic and addictive properties of ethanol and other sedative hypnotics, I discovered that alcohol and barbiturate tolerance and physical dependence are not biologically related (not the flip sides of the same coin as previously thought) (Ritzmann and Tabakoff, Dissociation of alcohol tolerance and dependence, *J Pharmacol Exp Ther* 199:158-170 (1976); Tabakoff et al., Brain noradrenergic systems as a prerequisite for developing tolerance to barbiturates, *Science* 200:449-515 (1978); Tabakoff and Ritzmann, The effects of 6-hydroxydopamine on tolerance to and dependence on ethanol, *J Pharmacol Exp Ther* 203:319-331 (1977)) and our concept has been supported by recent epidemiologic work during the development of DSM V.

III. While I served as the first Scientific Director of the NIAAA Intramural Program and integrated that Program into NIH, I worked with Paula Hoffman to generate the first observation that ethanol inhibited NMDA receptor function (Hoffman et al., N-methyl-D-aspartate receptors and ethanol: inhibition of

calcium flux and cyclic GMP production, *J Neurochem* 52:1937-1940 (1989); Hoffman et al., Selective inhibition by ethanol of glutamate stimulated cyclic GMP production in primary cultures of cerebellar granule cells. *Neuropharmacology* 28:12391243 (1989)), and we quickly followed this observation with evidence that chronic ethanol treatment produced an upregulation of NMDA receptors in brain (Grant et al., Ethanol withdrawal seizures and the NMDA receptor complex, *Eur J Pharmacol* 176:289-296 (1990); Gulya et al., Brain regional specificity and time-course of changes in the NMDA receptor-ionophore complex during ethanol withdrawal. *Brain Res* 547:129-134 (1991)). This work spurred a plethora of research which is still active today on the involvement of glutamate receptors in alcoholism, and alcohol induced brain damage.

IV. The interest in the NMDA receptor and its control of the second messenger functions of calcium in brain and our prior work on adenylyl cyclase led me to examine ethanol's actions on the cAMP generating signal transduction systems. In examining adenylyl cyclase (AC) activity we discerned that there was a type of AC that was particularly sensitive to ethanol's actions (stimulation of activity) (Hellevuo et al., A novel adenylyl cyclase sequence cloned from the human erythroleukemia cell line. *Biochem Biophys Res Commun* 192:311-318 (1993)). We cloned this form, giving it the identifier of Type 7 AC (Hellevuo et al., The characterization of a novel human adenylyl cyclase which is present in brain and other tissues. *J Biol Chem* 270:11581-11589 (1995)), mapped its genetic location in human and mouse, discovered polymorphisms, characterized the mechanisms of activation by ethanol (Nelson et al., Ethanol-induced phosphorylation and potentiation of the activity of type 7 adenylyl cyclase. Involvement of protein kinase C delta. *J Biol Chem* 278:4552-4560 (2003)), created K.O. and transgenic mice and pursued information regarding its physiologic role. One of the major functions of this Type 7 AC is in coupling of the CRF-1 receptor to cellular responses (i.e., anterior pituitary POMC synthesis and release of ACTH (Pronko et al., Type 7 adenylyl cyclase-mediated hypothalamic-pituitary-adrenal axis responsiveness: influence of ethanol and sex, *J Pharmacol Exp Ther* 334:44-52 (2010)). We, together with others, have performed several studies on the associations of polymorphisms in and around the Type 7 AC with the result that the Type 7 AC may influence alcoholism primarily in women (Desriviéres et al., Sex-specific role for adenylyl cyclase type 7 in alcohol dependence. *Biol Psychiatry* 69:1100-1108 (2011)) with depression as a co-morbidity. Others have also linked Type 7 AC to depression.

V. We have extended the genetic studies on alcoholism to encompass a system/network-based approach. Our recent work has made extensive use of genetical genomics in conjunction with phenotype analysis in selected lines and recombinant inbred strain combines with data from humans (Tabakoff et al., Genetical genomic determinants of alcohol consumption in rats and humans. *BMC Biol* 7:70 (2009)). Using both DNA and RNA sequencing in animal populations which allow for use of quantitative genetic analysis and novel application of filtering and network analysis techniques, we generated strong data for involvement of neuroimmune systems and glial elements in brain to alcohol preference (Saba et al., The sequenced rat brain transcriptome, its use in identifying networks predisposing alcohol consumption, *FEBS Journal* 282:3556 (2015).

VI. Using "rational drug design" (pharmacophore identification and computer modeling of ligand/receptor interactions, we designed a chemical structure that could selectively target NMDA receptors and the voltage sensitive sodium channels. The identification we envisioned for this chemical structure was chronic pain. Our aspirations and approach bore fruit and the details of our compound's molecular and cellular mechanisms of action as well as the compounds' (Kindolor's) actions as an antihyperalgesic have been published (Tabakoff et al., A novel substituted aminoquinoline selectively

targets voltage-sensitive sodium channel isoforms and NMDA receptor subtypes and alleviates chronic inflammatory and neuropathic pain. *Eur J Pharmacol* 784:114 (2016). We went on to synthesize a number of derivatives of the original structure and learned that we can redirect one version from acting on the NMDA receptor to acting on the $GABA_A$ receptor of a particular subunit composition. We demonstrated that our molecule acts as a positive allosteric modulator (PAM) at binding at a novel site on the $GABA_A$ receptor pentamer. These findings have recently been published (Borghese et al., Novel Molecule Exhibiting Selective Affinity for $GABA_A$ Receptor Subtypes. *Sci Rep* 7(1):6230 (2017), and patents have been assigned to Lohocla Research Corporation.

Publications

Papers Published

1. **Tabakoff B** and Erwin VG (1970) Purification and characterization of a reduced nicotinamide adenine dinucleotide phosphate-linked aldehyde reductase from brain. *J Biol Chem* 245:3263-3268.
2. Erwin VG, **Tabakoff B** and Bronaugh RL (1971) Inhibition of a reduced nicotinamide adenine dinucleotide phosphate-linked aldehyde reductase from bovine brain by barbiturates. *Mol Pharm* 7:169-176.
3. **Tabakoff B** and Alivisatos SGA (1972) Modified method for spectrophotometric determination of monoamine oxidase activity. *Anal Chem* 44:427-428.
4. Erwin VG, Heston WDW and **Tabakoff B** (1972) Purification and characterization of NADH-linked aldehyde reductase from bovine brain. *J Neurochem* 19:2269-2278.
5. **Tabakoff B**, Ungar F and Alivisatos SGA (1972) Aldehyde derivatives of indoleamines and the enhancement of their binding onto brain macromolecules by pentobarbital and acetaldehyde. *Nature* 238:126-128.
6. Alivisatos SGA, Ungar F, Callaghan OH, Levitt LP and **Tabakoff B** (1973) Inhibition of the formation of tetrahydroisoquinoline alkaloids in brain homogenates. *Can J Biochem* 51:28-38.
7. Alivisatos SGA and **Tabakoff B** (1973) Formation and metabolism of "biogenic" aldehydes. In: *Chemical Modulation of Brain Function*, Sabellid HC, ed, pp 41-66, Raven Press, New York.
8. **Tabakoff B**, Ungar F and Alivisatos (1973) SGA Addiction to barbiturates and ethanol: Possible biochemical mechanisms. *Adv Exp Med Biol* 35:45-55.
9. Ungar F, **Tabakoff B** and Alivisatos SGA (1973) Inhibition of binding of aldehydes of biogenic amines in tissues. *Biochem Pharmacol* 22:1905-1913.
10. **Tabakoff B**, Anderson R and Alivisatos SGA (1973) Enzymatic reduction of "biogenic" aldehydes in brain. *Mol Pharmacol* 9:428-437.
11. **Tabakoff B**, Meyerson L and Alivisatos SGA (1974) Properties of monoamine oxidase in nerve endings from two bovine brain areas. *Brain Res* 66:491-508.
12. **Tabakoff B**, Vugrincic C, Anderson R and Alivisatos SGA (1974) Reduction of chloral hydrate to trichloroethanol in brain extracts. *Biochem Pharmacol* 23:455-460.
13. **Tabakoff B** and Boggan WO (1974) Effects of ethanol on serotonin metabolism in brain. *J Neurochem* 22:759-764.
14. Ritzmann RF and **Tabakoff B** (1974), Effect of chronic ethanol administration on adrenal weights in mice. *Res Comm Chem Pathol Pharmacol* 7:217-220.
15. **Tabakoff B**, Groskopf W, Anderson R and Alivisatos SGA (1974) "Biogenic" aldehyde metabolism: Relation to pentose shunt activity in brain. *Biochem Pharmacol* 23:1707-1719.

16. Alivisatos SGA, Ungar F, Gerber M, Arora RC, Levitt LP and **Tabakoff B** (1974), Cellular distribution of nicotinamide adenine dinucleotide glycohydrolase in the central nervous system. *Biochem Pharmacol* 23:2060-2062.

17. Sladek JR, **Tabakoff B** and Garver D (1974) Certain biochemical correlates of intense serotonin histofluorescence in the brain stem of the neonatal monkey. *Brain Res* 67:363-371.

18. **Tabakoff B** (1974) Inhibition of sodium, potassium and magnesium activated ATPases by acetaldehyde and "biogenic" aldehydes. *Res Comm Chem Pathol Pharmacol* 7:621-624.

19. **Tabakoff B** and Gelpke CC (1975) Alcohol and aldehyde metabolism in brain. In: *Biochemical Pharmacology of Ethanol*, Majchrowicz E, ed, pp 141-164, Plenum Press, New York.

20. von Wartburg J-P, Berger D, Ris M and **Tabakoff B** (1975) Enzymes of biogenic aldehyde metabolism. In: *Alcohol Intoxication and Withdrawal*, Gross MM, ed, pp 119-138, Plenum Press, New York.

21. Rubenstein JA, Collins MA and **Tabakoff B** (1975) Inhibition of liver aldehyde dehydrogenase by pyrogallol and related compounds. *Experientia* 31:414-415.

22. **Tabakoff B**, Ritzmann RF and Boggan WO (1975) Inhibition of the transport of 5-hydroxyindoleacetic acid from brain by ethanol. *J Neurochem* 24:1043-1051.

23. Jourdikian F (Chordikian), **Tabakoff B** and Alivisatos SGA (1975) Ontogeny of multiple forms of monoamine oxidase in mouse brain. *Brain Res* 93:301-308.

24. **Tabakoff B**, Bulat M and Anderson RA (1975) Ethanol inhibition of transport of 5-hydroxyindoleacetic acid from cerebrospinal fluid. *Nature* 254:708-710.

25. **Tabakoff B** and von Wartburg J-P (1975) Separation of aldehyde reductases and alcohol dehydrogenase from brain by affinity chromatography: Metabolism of succinic semialdehyde and ethanol. *Biochem Biophys Res Comm* 63:957-966.

26. Ritzmann RF and **Tabakoff B** (1976) Ethanol, serotonin metabolism and body temperature. *Ann NY Acad Sci* 273:247-255.

27. **Tabakoff B**, Anderson RA and Ritzmann RF (1976) Brain acetaldehyde after ethanol administration. *Biochem Pharmacol* 25:1305-1309.

28. Collins MA, Custod JT, Rubenstein JA and **Tabakoff B** (1976) Studies on the effects of pyrogallol and the structurally related DOPA decarboxylase inhibitor RO 4-4602 on acetaldehyde metabolism. *Ann NY Acad Sci* 273:227-233.

29. Ritzmann RF and **Tabakoff B** (1976) Is serotonin or are its metabolites responsible for induction of hypothermia? *Experientia* 32:334-336

30. Nair V, **Tabakoff B**, Ungar F and Alivisatos SGA (1976) Ontogenesis of serotonergic systems in rat brain. *Res Commun Chem Pathol Pharmacol* 14:63-73.

31. Anderson RA, Meyerson LR and **Tabakoff B** (1976) Characteristics of enzymes forming 3-methoxy-4-hydroxyphenylethyleneglycol (MOPEG) in brain. *Neurochem Res* 1:525-540.

32. **Tabakoff B** and Radulovacki M (1976) Gamma-hydroxybutyrate in CSF during sleep and wakefulness. *Res Commun Chem Pathol Pharmacol* 14:587-590.

33. Ritzmann RF and **Tabakoff B** (1976) Dissociation of alcohol tolerance and dependence. *Nature* 263:418-420.

34. Ritzmann RF and **Tabakoff B** (1976) Body temperature in mice: A quantitative measure of alcohol tolerance and physical dependence. *J Pharmacol Exp Ther* 199:158-170.

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Resource Sharing

PhenoGen Website (http://Phenogen.ucdenver.edu). I established the PhenoGen website over 10 years ago to maintain and distribute RNA expression data and systems genetics tools. We (Spencer Mahaffey, Laura Saba, Boris Tabakoff) continue to expand and improve the website with new tools, visualizations, and data. Future development on PhenoGen will include a number of major functions. The primary focus will be on supporting, analyzing, and visualizing processed RNA-Seq data. Both raw and analyzed data at different steps in the analysis pipeline will continue to be provided publicly for download. Downloading and processing RNA-Seq data from any source is not a simple or quick process. In order to help researchers utilize this resource, files from each major pipeline step will be provided so a researcher can access files with reads already aligned or reconstructed transcriptomes or quantitative data on transcripts. In addition to providing a file repository, PhenoGen continues to provide tools to summarize and visualize all of the data collected in a simple and user-friendly manner. The Genome/Transcriptome Data Browser allows a user to enter a gene or genome region of interest and bring up what appears to be a typical genome browser graphic. However, the PhenoGen browser has extended functions to display data well beyond a typical genome browser. For example, this tool can display several types of data related to a co-expression module to let the user look for information about gene function through summary of Gene Ontology terms, possible regulation by validated and predicted miRNAs that target genes in the module, and module QTL locations are displayed as a Circos plot showing possible loci of control for the module throughout the genome. New data can be incorporated easily as the browser is modular so new tracks and visualization tools such as the Circos plots and WGCNA graphics can be added. New tracks to show alternative

poly-adenylation sites or alternate UTRs or miRNA targets will be added as data are generated to provide a detailed view of the transcriptome including possible organ specific regulation.

Abstracts

Dr. Tabakoff's list of abstracts for presentations at national and international meetings number over 600.